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The Parts of Definitions, Unity, and Sameness in Aristotle's *Metaphysics*

Mark R. Wheeler

First principles ($\alpha\rho\chi\acute{\alpha}\iota$) are crucial to Aristotle's conception of scientific knowledge ($\epsilon\pi\iota\sigma\tau\eta\mu\eta$). In the *Posterior Analytics*, Aristotle teaches us that all scientific knowledge is either knowledge arrived at through demonstration from first principles or knowledge of the first principles themselves. The first principles of a given science are the primary premises ($\tau\acute{\alpha}\ \pi\rho\acute{\omega}\tau\alpha$) of that science (*Pst. An.*, 72a7); they express the essential characteristics of the substance about which the given science is concerned; and all other scientific knowledge is derived from the first principles through syllogistic inference.¹

The first principles of the various sciences are expressed through definition ($\delta\rho\iota\sigma\mu\acute{o}\varsigma$). More precisely, the first principle of a science is a definition which provides an indemonstrable account of the essence ($\lambda\acute{o}\gamma\omicron\varsigma\ \tau\omicron\upsilon\ \tau\acute{\iota}$

¹On the importance of first principles and demonstration for Aristotle's philosophy of science, see Michael Ferejohn's *The Origins of Aristotelian Science* (New Haven: Yale, 1991) and Richard McKirahan's *Principles and Proofs: Aristotle's Theory of Demonstrative Science* (Princeton: Princeton University Press, 1992), especially chs. 2, 12, and 13.

ἐστὶν ἀναπόδεικτος) of the subject matter of the science.² Throughout the *Posterior Analytics*, Aristotle assumes that such definitions (usually termed "real definitions") are not only possible but actual, provides explanations for how we come to possess these definitions, and outlines methods for stating them clearly. Examples of first principles include the definition of "man" as "two-footed animal" and the definition of "arithmetical unit" as "indivisible quantity."

At least two conclusions follow from these considerations concerning first principles. First, unless we are in possession of the first principles of some science, we can have no scientific knowledge. Second, since we possess a first principle only if we possess a definition, any problem which threatens to undermine Aristotle's theory of definition is a threat to the project of Aristotelian science. In this paper, I investigate a problem for Aristotle's theory of definition of which Aristotle was fully aware, and I argue for an interpretation of Aristotle's solution to that problem which helps, in part, to explain the connections among Books Zeta, Eta, Theta, and Iota of the *Metaphysics*.

²In Book II chapter 10 of the *Posterior Analytics*, Aristotle distinguishes among three different kinds of definition: (1) definitions which express the meaning of a term without asserting that there is anything in the world corresponding to the definition, (2) definitions which explain through quasi-demonstration why a thing which exists in the world exists, and (3) definitions which provide indemonstrable accounts of essences, as apprehended through intuition (νοῦς). It is the latter of these three kinds that are of importance here.

That Aristotle's analysis of sensible substance in Book Zeta gives rise to difficulties in connection with his theory of definition is well known.³ Aristotle's attempt to reconcile his analysis of sensible substance (οὐσία) with his theory of definition as presented in his other works, particularly the *Posterior Analytics*, leads him to reconsider his account of definitions which express indemonstrable essences and to consider whether or not, and in what sense, definitions must include accounts of the parts of the substances being defined.

Initially, at least, the prospect of a successful reconciliation looks good. The concept of sensible substance is analyzed, and four candidates for primary substance are acknowledged (*Met.*, 1028b35): the essence (τὸ τί ἦν εἶναι), the universal (τὸ καθόλου), the genus (τὸ γένος), and the subject (τὸ ὑποκείμενον). The latter of these is then singled out as being in the truest sense substance, and Aristotle turns to investigation of the concept of subject. The concept of a subject is analyzed into its three separate senses (*Met.*, 1029a3): (1) the matter (ἡ ὕλη), (2) the form (ἡ μορφή = τὸ εἶδος), and (3) the composite of matter and form (τὸ ἐκ τούτων [τῆς ὕλης καὶ τοῦ εἶδους]); the form is identified with the essence; and the claim that the definition is an account of the essence of some substance is reaffirmed (*Met.*, 1030a8). All of this

³See Michael Ferejohn's forthcoming "Matter, Definition, and Generation in Aristotle's *Metaphysics*" and his forthcoming "The Definition of Generated Composites in Aristotle's *Metaphysics*," also Michael Frede's "The Definition of Sensible Substances in *Metaphysics Z*" in D. Devereux and P. Pellegrin, edd., *Biologie, Logique, et Métaphysique chez Aristote* (Paris 1990), pp. 113-144.

bodes well for the unity of the Aristotelian project of explaining scientific knowledge.

Not surprisingly, difficulties soon threaten. Beginning at Zeta 10, Aristotle raises the following compound question (*Met.*, 1034b20): Since all definitions are formulae and all formulae have parts, what are the parts of the definition and how are the parts of the definitions related to the whole? Aristotle answers the first part of this question handily by way of the following conclusions (see, for Aristotle's summary of these points, *Met.*, 1037a21): All definitions of sensible substances are formulae of essences which are composed of parts; the only terms included in a definition of sensible substance are terms which refer to parts of the essence of the sensible substance (*Met.*, 1035b34); and no terms which refer to the material parts of sensible substance are included in the definition of sensible substance (*Met.*, 1036a9). The remaining part of the question, however, is not so easily answered.

The question of how the parts of a definition are related to the whole so as to form a unity is an outstanding question for Aristotle's theory of definition as presented in the *Posterior Analytics* (cf. *Pst. An.*, 93b35). To get at the fundamental problem as Aristotle understood it, I turn now to a reconstruction of a *reductio ad absurdum* Aristotle constructs on the basis of it. Considerable attention has been paid to book Zeta chapter 13 of the *Metaphysics* with regard to Aristotle's theory of primary substances,⁴ less

⁴See Alan Code's "No Universal is a Substance: An Interpretation of *Metaphysics* Z13, 1038b8-15" in *Paidea* (1978), Special Aristotle Issue, pp. 65-74, and Michael Woods' "Problems in *Metaphysics* Z, Chapter 13" in *Aristotle: A Collection of Critical Essays*, ed. Julius

attention has been given to how Zeta 13 bears on Aristotle's theory of definition. Given the close ties which bind Aristotle's theory of definition to his theory of primary substances, one might think that this is because Zeta 13 has no bearing on Aristotle's theory of definition. But, at the end of Zeta 13, Aristotle presents the following *reductio ad absurdum*:

If no substance can consist of universals, because they mean "of such a kind," and not a particular thing; and if no substance can actually be composed [σύνθετον] of substances, every substance will be incomposite [ἀσύνθετον], and so there will be no formula [λόγος] of any substance. But in point of fact it is universally held, and has been previously stated, that substance is the only or chief subject of definition [ᾧ ρον]; but on this showing there is no definition [ὁρισμός] even of substance. Then there can be no definition of anything; or rather in a sense there can, and in a sense there cannot. What this means will be clearer from what follows later. (*Met.*, 1039a14-23; trans. Tredennick)

Moravcsik, (New York, 1967), pp. 215-238, for discussions on these points. The discussion in the secondary literature focuses on Aristotle's claims concerning the universality of substance. My arguments here assume that Aristotle is committed to the claim that primary substance is a universal of some sort, viz., that the infima species which is predicated of the matter is universal in some sense of καθόλου. I leave to one side whether or not Aristotle is inconsistent in his full account of substance.

The first feature of this passage worth noting is Aristotle's recognition that some of his assumptions concerning substance in the *Metaphysics* seem to entail that there can be no definition of substance. But this is of course absurd, since on all accounts "substance is the only or chief subject of definition." The second feature of note is that Aristotle immediately reassures the reader that all is not lost: At least in one sense of what he means by "definition," there can be a definition of substance, and Aristotle promises to make clear what he means by this in the sequel. Thus, there are two ways in which Zeta 13 appears to play a crucial role in our understanding the difficulties confronting Aristotle's theory of definition in the *Metaphysics*: First, he presents in a concise fashion the problem as he sees it; second, he informs us that the solution to the problem is to be solved in some part of the *Metaphysics* following Zeta 13.

Turning now to the problem as Aristotle presents it, I assume for the moment that none of the terms in the passage from Zeta 13 are ambiguous. Appealing to parts of the *Metaphysics* and of the *Posterior Analytics* already discussed above for Aristotle's implicit assumptions, a preliminary reconstruction reveals that the following premises entail the claim that there can be no definition of substance:

A) All substances are incomposite (ἁσύνθετα).

B) All definitions are composite (σύντετα).⁵

⁵See, e.g., *Met.*, 1034b20 & 1042a20.

C) All definitions have the same structure (εἶδος)⁶ as that of which they are definitions.⁷

Premise A follows from the following premises 1-3, each of which Aristotle accepts:

(1) *No substance can consist of universals.* Here I read "consist of" as meaning "composed of" in the sense of "has for parts." Reading "consists of" in this way, the following reasoning justifies premise 1. Aristotle is at least committed to the claim that not all universals are substance. We know this because qualities and quantities (which are universals) cannot be ontologically prior to substances, and the higher genera (also universals) are ontologically posterior to and dependent upon the species. Thus,

⁶The crucial passage giving rise to this interpretation of the relation between the parts of formulae and the parts of things is the following:

Ἐπει δὲ ὁ ὁρισμὸς λόγος ἐστὶ, τὰ δὲ λόγος μέρη ἔχει, ὥς δὲ ὁ λόγος πρὸς τὸ πρᾶγμα, καὶ τὸ μέρος τοῦ λόγου πρὸς τὸ μέρος τοῦ πράγματος ὁμοίως ἔχει, ἀπορεῖται ἤδη πότερον δεῖ τὸν τῶν μερῶν λόγον ἐνυπάρχειν ἐν τῷ τοῦ ὅλου λόγῳ ἢ οὐ. (1034b20-24)

One way of understanding Aristotle's use of εἶδος is "structure." Since the discussion here concerns essences and essences are, for Aristotle, identified with the species form (which is another use of "εἶδος"), I have chosen to render "εἶδος" as "structure" in connection with the question of how the parts of λόγοι are related to the whole in the same way that the parts of the thing are related to the whole.

⁷See, e.g., *Met.*, 1034b21.

substance cannot have as parts these kinds of universals because they cannot exist independently of substance.

Further, if anything is a substance and is universal in nature, it is the *infima species*. Let us suppose, as is reasonable, that primary substance is to be identified with the *infima species*. The *infima species* are universals of some sort, so substance might consist of this kind of substance. But by Zeta 13 of the *Metaphysics*, Aristotle has ruled out any candidate for substance other than the matter, the *infima species*, and the composite of these. Thus, insofar as substance can consist of universals, either the matter must consist of universals, which is false since matter is indeterminate, or the *infima species* must, which is false since these are indivisible, or the concrete individual must, which again is false because the concrete individual is separable into matter and *infima species* only in theory not in the strong sense required. Thus, substance is not composed of universals in the sense of *infima species* either.

Since qualities (of various categories), quantities and substances exhaust Aristotle's ontology, no substance consists of universals.

(2) *No substance can be composed of other substances.* Again, "composed of" here is to be understood in the sense of having parts which can exist independently. If substance = essence, we know the *infima species* is indivisible. *A fortiori*, we know that it cannot be composed of others of its ilk. If substance = matter, it is clear that matter is not composed of substances for Aristotle. If substance = concrete individual, the concrete individual insofar as it is a substance is not composed of parts which can exist independently.

(3) *If no substance can be composed of other substances and no substance can consist of universals, then every*

substance is incomposite. Either something is a substance or a universal. If substances are not composed of either substances or universals, then they are not composed of anything. If substances are not composed of anything, then they are incomposite.

A) Every substance is incomposite.

(#1) No substance is composite.

Premise B & C and an additional assumption, each of which Aristotle accepts, entail the following conclusion #2:

(a) All formulae are composite. [*Met.*, 1034b20, 1042a20]

(b) Nothing composite has the same structure as something incomposite.

(c) All formulae have the same structure as the things of which they are formulae. [e.g., *Met.*, 1034b21]

(d) All definitions are formulae.

(#2) All definitions are definitions of composite things.

Aristotle remains committed to some version of all three of these assumptions throughout the *Metaphysics*, but he also believes he can consistently maintain that there are definitions of substance. Aristotle avoids this apparent inconsistency by showing that each of the premises A-C contains an ambiguous term. Aristotle's solution depends upon recognizing the ambiguity of four terms contained in

premises A-C: "substance," "composite," "same," and "definition." By Zeta 13, Aristotle has narrowed the problem down to disambiguating the various senses of the term "definition," and it is a distinction in the senses of "definition" which Aristotle introduces in subsequent parts of the *Metaphysics* in order to solve his problem. Before presenting my interpretation of how Aristotle resolves the problem, I will clarify the meanings of the important terms contained in the premises.

Aristotle's claims concerning definitions in the passage from Zeta 13 are to be understood in the sense we have been working with all along, viz., an indemonstrable account of the essence. Prior to this point in Zeta, Aristotle has distinguished among a number of different candidates for definitions and has narrowed the field considerably. Definitions of the concrete particular and definitions of the matter, as well as definitions of qualities, quantities and accidental compounds, have been dismissed by Aristotle before Zeta 13 as being only of secondary import. (For Aristotle's explicit rejections of the former kinds of definitions see *Met.* 1036a and 1037a26 respectively, for the latter kinds see *Met.*, 1030a12.).⁸

⁸Among the possible kinds of definitions of substance, Aristotle countenances three, each of which corresponds to a kind of substance investigated in the *Metaphysics*: (1) definition of the matter, (2) definition of the essence, and (3) definition of the concrete individual which is the combination of matter and essence. Aristotle cannot allow for definitions of matter if "matter" is understood in the way Aristotle explicates it prior to Zeta 13 as that which is "neither a particular thing nor a quantity nor designated by any of the categories which define Being" (*Met.*, 1029a20).

When he uses the term "substance" in Zeta 13, Aristotle is talking about either the matter, the concrete particular or the essence. Aristotle is clearly concerned with sensible substance in the middle books of the *Metaphysics*. Given

One simply cannot define that which falls under none of the categories which define Being. Later, in Book Eta, Aristotle again talks of definitions of matter, but his discussion there concerns the definitions proposed by other philosophers and does not bear on his conclusions in Zeta.

Aristotle does not allow for definitions of concrete individuals. Aristotle does not demonstrate in full the impossibility of definitions of concrete individuals until Zeta 15, and this fact has lead at least one commentator, Tredennick, to conclude that this sense of definition was still in the running at Zeta 13. Two things make this reading untenable. First, Aristotle had already discounted this kind of definition of substance prior to Zeta 13 and had presented his reasons for doing so (see Zeta 11 and 12, especially 1036a5). Furthermore, Zeta 15 is part of a polemic against the Platonist conception of substantial Forms understood as concrete individuals which Aristotle began at Zeta 14; as such, the rehearsing of the arguments for the impossibility of definitions of concrete particulars in Zeta 15 is best understood as supporting Aristotle's attack on the Platonist position.

These considerations lead to the conclusion that by Zeta 13 Aristotle has ruled out every kind of definition except for definitions of the essence. This contention is strengthened by the fact that Aristotle has asserted in many places prior to Zeta 13 that real definitions are the primary and unqualified kind of definition of substance (see, e.g., *Met.*, 1030b5).

that Aristotle has concluded that there can be in no sense definitions of the matter or of the concrete particular and given that Aristotle has argued, prior to Zeta 13, that the essence is substance in the primary sense of the term, it seems clear Aristotle is referring to the essence of sensible substance when he puzzles over the connection between definitions and substance in Zeta 13.

In virtue of what has been said, we can restate the three assumptions listed above:

A') All essences ($\tau\acute{\alpha} \tau\acute{\iota} \eta\nu \epsilon\acute{\iota}\nu\alpha\iota$) of sensible substances are *incomposite* ($\acute{\alpha}\sigma\acute{\upsilon}\nu\theta\epsilon\tau\alpha$).

B') All definitions are *composite* ($\sigma\acute{\upsilon}\nu\theta\epsilon\tau\alpha$).

C') All definitions have the same structure ($\epsilon\acute{\iota}\delta\omicron\varsigma$) as the essences ($\tau\acute{\alpha} \tau\acute{\iota} \eta\nu \epsilon\acute{\iota}\nu\alpha\iota$) of which they are definitions.

We can likewise reconstrue Aristotle's proposed solution to the problem in the following way: In one sense of "definition," there can be no definition of the essence of sensible substances; in another sense, there can be definitions of the essence of sensible substances.

Having clarified the relevant senses of "substance" and of "definition" in the above premises, I will now focus on some other problematic terms in the premises. Premise A' contains the terms "essence" ($\tau\acute{\alpha} \tau\acute{\iota} \eta\nu \epsilon\acute{\iota}\nu\alpha\iota$) and "incomposite" ($\acute{\alpha}\sigma\acute{\upsilon}\nu\theta\epsilon\tau\alpha$). While not pretending to provide a detailed analysis of Aristotelian essences, I can make some remarks sufficient for my purposes here. In the *Metaphysics*, essences of sensible substances are the primary substances of the sensible world; that is to say, they are the ontologically fundamental constituents of the

Aristotelian sensible universe. Each essence of a sensible substance is its form (e.g., the essence of man is the form that all men exhibit, which form is an *infima species* of the genus animal), certain groups of essences are grouped together into classes called "genera" (e.g., the essence of man, the essence of dog and the essence of cat can be grouped together under the genus "animal"), and essences are types of which there must be tokens (e.g., Aristotle was a token of the type man). This last claim, which is somewhat controversial, is particularly important for my discussion here. In claiming that essences of sensible substances must have tokens, I am assuming that the essences of sensible substances cannot exist separately from the concrete individuals of which they are the essences. There cannot be an essence of man unless there is at least one concrete particular which is a combination of the essence of man and the matter appropriate to man. This assumption is well supported by what Aristotle asserts in chapter Zeta; for example,

Is there then some sphere besides the particular spheres, or some house besides the bricks? Surely no individual thing would ever have been generated if form had existed thus independently. (*Met.*, 1033b21; trans. Tredennick)

A consequence of this view is that the essences of sensible substances cannot exist separately from matter.

Aristotle asserts that the essences of sensible substances are incomposite (ἄσύνθετα). Plato used ἄσύνθετα in the *Phaedo* (78c) in connection with composite objects and natural compounds, and the thrust of the discussion there is to distinguish things which can be broken up into parts, and things such as the soul which cannot be so dispersed.

Likewise in the *Theaetetus*, Plato refers to the primary elements of which other things are composed as incomposite (ἀσύνθετα). Aristotle adopts Plato's use of ἀσύνθετα in connection with part-whole relations.

Aristotle discusses various part-whole (μέρος-ὅλος) relations in Book Delta, chapter 25, of the *Metaphysics*,⁴ but it will suffice here to consider two of these. The first kind of part-whole relation obtains between things (τόδε τι) which are divisible into parts which are themselves individual things (τόδε τι). The second kind of part-whole relation obtains between a form (τὸ εἶδος) and its constituent parts (parts which are not themselves individual things (ἄνευ τοῦ ποσοῦ). In what follows, I refer to the first kind of part-whole relation as the aggregate conception, and the second as the essential conception.

Premise B' concerns definitions and asserts that all definitions have parts. This is a corollary of Aristotle's claim, made in various places, that all formulae have parts. (see, e.g., *Met.*, 1034b20, 1042a20) It is sufficient in this context to state that the parts of formulae and, hence, of definitions are nouns (see *De Int.*). Aristotle uses λόγος to refer variously to either linguistic entities (usually termed "accounts"), conceptual entities, or essences themselves. While disentangling these different uses of λόγος may be important for other reasons, I do not believe that these considerations have any bearing on the arguments developed here. For ease in exposition, I will render λόγος in the sense of a linguistic account in what follows.

All definitions are formulae of essences. Aristotle states that the formula of the essence is the formula composed of the ultimate differentia and its primary genus (see, e.g., *Met.*, 1038a5, 1038a19 and 1038a25). The ultimate differentia (e.g., rational) and the primary genus (e.g., animal) constitute the parts of the definition (e.g., of man).

Thus, definitions satisfy Aristotle's requirement that all formulae have parts, and we can restate premise B' to read "All definitions are composed of the ultimate differentia and its primary genus."

Premise C is derived from the following passage concerning definitions and formulae:

Since a definition is a formula, and every formula has parts; and since the formula is related to the thing in the same way as the part of the formula to the part of the thing, the question now arises; Must the formula of the parts be contained in the formula of the whole, or not? (*Met.*, 1034b20-24; trans. Tredennick)

While this passage explains in full neither how formulae are related to the things of which they are formulae nor how the parts of formulae are related to the parts of things to which they refer, Aristotle does present here a compositional account of the relation whereby insofar as formulae are related to things so too the parts of formulae are related to the parts of things. Using Aristotle's example at *Met.*, 1043a13ff., in the formula for a house there will be a part referring to the matter of a house (stones, bricks, and wood) and a part referring to the essence of a house (a receptacle for retaining goods and bodies). From this we can plausibly conclude that, insofar as a formula taken as a whole is related to something, the parts of the formula must likewise be related to the parts of the thing. Since this constraint concerns the relation of parts of formulae with parts of things, it can be construed as a relation between the structures of formulae and the structures of things.

Turning now to discuss Aristotle's concept of "sameness" as explicated in the *Metaphysics*, anything which is the same as something else is in some sense one with that other thing. Aristotle distinguishes among four different kinds of oneness: numerical oneness, formal oneness, generic oneness, and analogical oneness (*Met.*, 1016b30ff.). Two things are numerically one just in case they cannot be distinguished materially. For example in the *Odyssey*, Odysseus and Noman are numerically one because their material composition cannot be distinguished. Two things are formally one just in case their real definitions cannot be distinguished. For example, any two people are formally the same because the real definition for human beings applies to them both. Two things are generically one just in case they are both subsumed under one genus.⁹ For example, a cat and a mouse are generically one because they are both species of the genus "animal." Finally, two things are analogically one just in case one stands in relation to something as the other stands in relation to yet a fourth. Aristotle's way of putting this at 1016b35 seems somewhat strange at first, but upon closer inspection his account accords with our usual understanding of analogy. Aristotle claims that two things are analogically the same if they stand in a relation to each other as a third thing does to a fourth. We typically think of analogy in terms of relational sameness. Thus, the relation between the soul and the body is analogous to the relation between a pilot and his ship; the soul and the captain are said to have analogous roles. Aristotle's formulation would have this relation expressed in something

⁹Aristotle claims that genera are one in a way similar to the way in which matter is one (*Met.*, 1016a25).

like the following way: The captain and the soul are analogously the same because the captain is to the soul as the ship is to the body. While perhaps strange for us, the idea captured is identical.¹⁰

Again reworking the premises, we get:

A'') All essences of sensible substance are incomposite.

¹⁰If we wish to think of the sameness relation or the oneness relation as a two-place relation asserting the identity (understood the way we typically understand it) of its relata, then we can understand Aristotle's distinctions among the four senses of sameness and oneness in the following way: (1) If two things are asserted to be numerically the same or numerically one, then this is equivalent to saying that the matter of the former is identical with the matter of the latter; (2) If two things are asserted to be formally the same, then this is equivalent to saying that the essence of the former is identical with the essence of the latter; and like transformations apply for the generic and analogical species of sameness and oneness. Note that in going from the Aristotelian formulation to the formulation in terms of identity, the relata may change. For example, it makes perfect sense for Aristotle to claim that Socrates is formally the same as Callias, but it would be incorrect to claim that Socrates is identical with Callias. Rather if the relation of formal sameness obtains between Socrates and Callias, then the essence of Socrates is identical with the essence of Callias. The relata in the case of the formal sameness relation are Socrates and Callias, but in the case of the identity relation, the relata are their respective essences.

B'') All definitions are composed of the term referring to an ultimate differentia and the term referring to a primary genus.

C'') All definitions have the same structure as the essences of which they are definitions.

These four premises still apparently entail the conclusion that there can be no definitions of substance, but on the basis of this last reconstruction Aristotle's problem now can be stated clearly. All definitions are composite, while all essences are incomposite. The structures of definitions must be the same as the structures of those things of which they are formulae, viz. essences. So, either Aristotle can explain how a formula which is composite can have the same structure as an essence which is incomposite, or he must reject one of his assumptions. I will now argue that Aristotle distinguishes between two kinds of definitions, of which one has a structure which is analogously the same as the structure of the essence to which it refers.

It was stated that definitions are formulae composed of the ultimate differentia and the primary genus. In what sense of "composite" (σύνθετα) are definitions separable into parts for Aristotle? One possible alternative is that definitions are divisible into independently existing, meaningful conceptual parts, viz., the ultimate differentia and the primary genus. This would be to attribute the aggregate view of the part-whole relation to the structure of definitions, and this is the sense in which Aristotle believes that the Platonists conceive of their definitions; for on Aristotle's reading of the Platonist position, every meaningful concept involved in a Platonic division is independently meaningful and can stand alone as a concept in virtue of its referring to a corresponding substance, viz.,

its Form (see Zeta 15). For example, the concept of animal was meaningful because it referred to the Form of animalness. The Platonist had posited these independently existing substances, at least in part, to secure a fixed meaning for our language and concepts. Each term in the Platonist definition would be meaningful in virtue of some corresponding substantial Form which is its semantic ground. Thus on the Platonist account, it would be possible for the primary genus, animal, to be a meaningful concept even if all concrete particular instances of animals went out of existence; for, it refers to its own universal substance, viz., the Form of animalness. Like considerations apply to all other meaningful concepts for the Platonist. Aristotle's arguments from Zeta 13 through Zeta 16 can be understood, in part, as attempts to refute this Platonic conception of the parts of definitions by undermining the claim that any universal is a substance in the way that Aristotle understands the Platonic Forms to be substances; having shown by means of these arguments that no such universal substances can exist, Aristotle believes he has effectively removed the semantic ground for the Platonic conception of language and concepts.

Having argued against the Platonist's conception definition, Aristotle turns to his alternative conception, a project which takes him beyond book Zeta into Books Eta, Theta, and Iota.

Aristotle introduced the concept of matter in order to deal with certain metaphysical problems concerning changes of sensible substances. In working out the epistemological presuppositions of his theory of sensible substance in the *Metaphysics*, Aristotle was forced to incorporate his distinction between matter and essence into his theory of definition as proposed in the *Posterior Analytics*.

In Zeta 11, Aristotle had rejected the claim that terms referring to the material parts of sensible substances were to be included in the formula of the essence; he also rejected the claim that there was a formula of the matter. The material parts were not included because they were not a part of the essence of the sensible substance, and the definition was of the essence; and there could be no definition of the matter, since matter was indeterminate. Nevertheless, Aristotle recognizes in Zeta 11 that to expunge reference to the matter of sensible substances from definitions of sensible substances would be a mistake, since the material nature of sensible substance is one of its essential characteristics.

Hence to reduce everything in this way and to dispose of the matter is going too far . . . For the animal is sensible and cannot be defined without motion, and hence not unless its parts are in some definite condition; for it is not a hand in any condition that is a part of a man, but only when it can perform its function. (*Met.*, 1036b22-23, 28-31; trans. Tredennick)

Aristotle puts off his investigation into how the material aspect of sensible substance is to be accommodated in the definition until Zeta 12 where he takes up the question in connection with the method of division.

According to Aristotle, either the primary genus absolutely does not exist as a meaningful concept independently of its ultimate differentiae or the primary genus exists as a meaningful concept only insofar as it refers to the proximate matter.

If then, the genus absolutely does not exist apart from the species which it includes, or if it exists, but only as matter (for speech is genus and matter, and the differentia make the species, i.e., the letters, out of it), obviously the definition is the formula composed of the differentiae. (*Met.*, 1038a6; trans. Tredennick)

In the first case, Aristotle alludes to his doctrine in the *Categories* (2b5ff.) according to which all genera are ontologically dependent upon their *infima species*, which in turn are ontologically dependent upon the particulars which they subsume. On this reading, the term referring to the primary genus would fail to refer if all of its subordinate species ceased to exist. For example, "animal" would fail to refer if all of the various species of animals went out of existence. In the second case, Aristotle suggests the doctrine presented in Book Eta chapter 6 where he identifies the primary genus with the proximate matter and the ultimate differentia with the form. The crucial passage comes at *Met.* 1045a15:

What is it, then, that makes "man" one thing, and why does it make him one thing and not many, e.g. "animal" and "two-footed," especially if, as some say, there is an Idea of "animal" and an Idea of "two-footed"? . . . But if, as we maintain, man is part matter and part form—the matter being potentially, and the form actually man—, the point we are investigating will no longer seem to be a difficulty. For this difficulty is just the same as we should have if the definition of X were "round bronze"; for this name would give a clue to the formula; . . . The difficulty is no longer apparent,

because the one is matter and the other form. (trans. Tredennick)

Aristotle is here talking about the definition of "man" as "two-footed animal" and claims that the parts of the definition "two-footed" and "animal" are essential parts of the definition, one of which refers to the formal aspect of the essence of the sensible substance man and the other to the material aspect. As he goes on to claim, with regard to the definitions of sensible substance, "part of the formula is always matter and part actuality" (*Met.*, 1045a35). It is crucial to note here that Aristotle claims that both essences of sensible substance and definitions of sensible substances involve a part which is material, i.e., potentiality, and part which is actuality; the case of man is intended as an instance of this general claim. This has important ramifications for our reconstruction of the problem in Zeta 13, for now it becomes clear that premise A' needs to be reevaluated.

Premise A' asserts that all essences of sensible substances are *incomposite* (*ἄσύνθετα*). It now appears that the essences of sensible substances are composite in that they involve parts one of which is actuality and one of which is potentiality. Has Aristotle thus rescinded his claim made in Zeta 13? No. It is still the case that the essences are *incomposite*, if by *incomposite* we mean the aggregate conception of the part-whole relation. It is this Platonic sense of the composite nature of sensible substances which Aristotle denies in Zeta 13, and it is against this conception of the composite nature of sensible substances that the arguments in Zeta 14-16 are directed. Once the parts of the sensible substance are explained in terms of actuality and potentiality, Aristotle can adopt a revised premise A'', which can be expressed as follows:

A''') All essences of sensible substances are composed of a part which is potentiality and a part which is actuality.

Aristotle incorporates the material aspect of the essence of sensible substances into the definitions of sensible substances by identifying it with the primary genus of the sensible substance. If the primary genus refers to the proximate matter, then Aristotle is committed to the claim that the primary genus is potentially some substance (e.g., *De An.* 412b10ff.). For example, if the proximate matter of a human being, viz., flesh and bones, lacks the essence of human being, viz., soul, then that proximate matter does not possess any definite nature, any life (*Met.*, 1036b32). The primary genus "animal" refers to the proximate matter which is potentially a human being; the matter is, in this instance, only homonymously called "human." On the other hand, if the proximate matter of a human being is informed by a soul, then the primary genus "animal" again refers to the proximate matter; but in this case, in virtue of the essence which informs the proximate matter and which makes it actually a human being, the genus is a part of the definition of the essence of that human being.

Conversely, with regard to sensible substances and as was noted above, the essence cannot exist separately from the proximate matter. Unless the requisite matter is present, there can be no instantiation of the actuality of man. Aristotle discusses this reciprocal dependence of proximate matter and essence in terms of potentiality and actuality. The essences of sensible substances are the actualities of sensible substances, while the proximate materials of sensible substances are the potentialities of sensible substances. This is, in part, the import of Aristotle's investigations in Book Theta into actuality and

potentiality for his doctrine of sensible substance and his theory of definition.

These considerations lead to the following revised premise B''':

B''') All definitions are composed of a term referring to the actuality of the sensible substance (viz., ultimate differentia) and a term referring to the proximate matter of the sensible substance (viz., the primary genus).

We must still determine how the parts of the definition so construed enable Aristotle to claim that the structure of a definition is the same as the structure of the essence of the sensible substance to which it refers. But putting the various premises together, the prospect for resolving the problem now appears, for the second time, good:

A''') All essences of sensible substances are composed of a part which is potentiality and a part which is actuality.

B''') All definitions are composed of a term referring to the actuality of the sensible substance (viz., ultimate differentia) and a term referring to the potentiality of the sensible substance (viz., the primary genus).

C'') All definitions have the same structure as the essences of which they are definitions.

At 1043b29, Aristotle claims that there can be definition only of substances which essentially involve a combination of actuality and potentiality, viz., sensible substances or intelligible substances, and he argues against the claim that there can be definitions of substances which are either pure

actuality or pure potentiality. He argues for these conclusions on the basis of premise C'', claiming that the defining formula denotes something predicated of something, and this must be partly of the nature of matter and partly of the nature of form. Immediately following this discussion, he compares the unity ($\epsilon\nu$) of numbers with the unity ($\epsilon\nu$) of definitions. Numbers, Aristotle claims, are substances in the same way that sensible substances are substances, i.e., the account of their unity essentially involves both actuality and potentiality.

Just as when any element which composes the number is subtracted or added, it is no longer the same number but a different one, however small the subtraction or addition is; so neither the definition nor the essence will continue to exist if something is subtracted from or added to it. And a number must be something in virtue of which it is a unity...And the definition is a unity...each substance is a kind of actuality and nature. (*Met.*, 1043b36-1044a3, 5-6, 9; trans. Tredennick)

Just as some of Aristotle's contemporaries had argued that the unity of a definition could be explained in terms of aggregation, so also had some argued that the unity of number was explainable in terms of aggregation (cf. *Met.*, 1041b10 and Plato's *Theatetus* 202Aff.). Since the definition of sensible substance involves parts, one might argue that the unity of the definition consists in the aggregation of the parts, and it is this suggestion that Aristotle wishes to confute, recognizing that this conception of definition allows for such things as the Iliad to count as a definition. The success of Aristotle's refutation of the aggregate conception of the unity of definition turns on his account of the unity of an actuality or kind of nature.

In marshaling his argument against the claim that the unity of definition is to be understood in terms of aggregate conception of the part-whole relation, Aristotle claims that there is a sense of unity ($\epsilon\upsilon$) which explains the unity of numbers, definitions, and essences. Aristotle had presented his analysis of the concept of unity in Book Delta (see above), but he returns to this analysis in Book Iota, and it is there that we find Aristotle's explanation of the unity of sensible substance, definition, and number in terms of the essential conception of the part-whole relation. Aristotle distinguishes between two similar questions "What sort of things are called one ($\epsilon\upsilon$)?" and "What is essential unity ($\tau\omicron \epsilon\nu\iota \epsilon\iota\nu\alpha\iota$), and what is the formula?" The former question he takes himself to have answered in Book Delta. The latter question (the question of the moment) differs from the first question, according to Aristotle, in that the first concerns how the term ($\delta\nu\omicron\mu\alpha$) "one" is used while the second question concerns the denotation ($\delta\acute{\upsilon}\nu\alpha\mu\iota\varsigma$) of the term. Aristotle answers the second question as follows:

To be one ($\tau\omicron \epsilon\nu\iota \epsilon\iota\nu\alpha\iota$) is to be indivisible ($\tau\omicron \alpha\delta\iota\alpha\iota\rho\acute{\epsilon}\tau\omega \acute{\epsilon}\sigma\tau\iota\nu$) (being essentially a particular thing, distinct and separate in place or form or thought), or to be whole and indivisible; but especially to be the first measure of each kind ($\tau\omicron \mu\acute{\epsilon}\tau\rho\omega \epsilon\iota\nu\alpha\iota \pi\rho\acute{\omega}\tau\omega \acute{\epsilon}\kappa\acute{\alpha}\sigma\tau\omicron\upsilon \gamma\acute{\epsilon}\nu\omicron\upsilon\varsigma \kappa\alpha\iota \kappa\upsilon\rho\iota\acute{\omega}\tau\alpha\tau\alpha \tau\omicron\upsilon \pi\omicron\sigma\sigma\acute{\omicron}\upsilon$). (*Met.*, 1052b16-19, loosely following Tredennick)

The nature of unity must be the same for all categories.
(*Met.*, 1053b24, trans. Tredennick)

From these passages we can derive a number of germane conclusions. All essences are unities because they are the indivisible units of their respective kinds, distinctive in

form. Likewise, all definitions are unities because they are the indivisible units, the *infima species* composed of the ultimate differentia and the primary genus, of their respective conceptual hierarchies (see Zeta 12 for Aristotle's claims on this point). Essences are indivisible in the sense that they consist of parts which are not themselves individual things (one is pure actuality and the other pure potentiality), but they are divisible into parts corresponding to the actuality and the potentiality of the sensible substance. Likewise, definitions are not divisible into parts which themselves refer to individual things (one refers to the actuality and the other to the potentiality of some essence, neither of which is an individual thing), but they are divisible into parts corresponding to the concepts referring to the actuality and the potentiality.

Thus we come to the resolution of the problem raised at the end of Zeta 13. The structure of a definition of substance is analogously the same as the structure of an essence of sensible substance because the definition is to the *de se* category of substance what the essence of sensible substance is to the *de re* category of substance. Or, to put it in a more Aristotelian formulation, a definition of sensible substance is analogously the same as an essence of sensible substance because they are related in the same way that the *de se* category of substance is related to the *de re* category of substance.

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